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REMARKS

After entry of this Amendment, claims 1-18 are pending in the application. Claims 1 and 18 have been amended to more particularly point out and distinctly claim the subject matter the Applicants regard as the invention. The amendments to claims 1 and 18 do not raise the issue of new matter and do not require further search. Reconsideration of the application as amended is requested.

In the Office Action dated October 30, 2002, Claim 18 is objected to because "the light emitting diode" lacks proper antecedent basis. This informality has been corrected in this Amendment. Reconsideration and withdrawal of the Examiner's objection is requested.

Claims 1-6 and 8-10 stand rejected under 35 U.S.C. § 102(b) as being unpatentable in view of Nakamura, et al., U.S. Patent No. 4,636,643. This rejection has been maintained from the previous Office Action dated July 19, 2002. In response to the previous Office Action, the Applicant asserted that the device of Nakamura, et al., does not teach or suggest a control unit that both manages the radiation source and analyzes the rays received by the photo detector. The Examiner addressed this assertion by stating that "the claim language in claim 1 does not prevent the combination of the admitting control circuit 7 and the microprocessor 10 collectively as a 'control unit' in the device of Nakamura, et al."

Claim 1 has been amended to more particularly point out and distinctly claim that the device for detecting particles on a windshield includes a single controller. This structure of a single controller is not taught or suggested by Nakamura, et al. Furthermore, a single controller is not taught or suggested by any of the other five (5) references cited by the Examiner in the most recent Office Action or the previous Office Action dated July 19, 2002. The Examiner has stated that a "control unit (7 and 10) . . . performs the same functions as claimed in Claim 1." However, claim 1 is not a method claim; the functions performed by the single controller are not being claimed. Claim 1 is an apparatus claim directed to the structure of the invention.

The single control unit recited in claim 1 is not a mere reduction in components with respect to a device having two controllers, as taught by Nakamura,

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et al., but provides unexpected benefits. In particular, the single control unit as recited in claim 1 can analyze the images received by the imaging array based, at least in part, on the known frequency and/or intensity and/or duration of the light emitted by the light emitting diode. This is described in the application, page 5, paragraph 16 of the substitute specification. The reflective characteristics of a particle can be different when the particle is subject to light rays of different frequencies, intensities, and durations. The device of present invention provides a single control unit to determine the nature of the particle and its position outside or inside of the windshield with great accuracy by analysis of the rays reflected from the particles and received by the photodetector. It is therefore submitted that claim 1 patentably defines over Nakamura, et al. and is in suitable condition for allowance. Claims 2-6 and 8-10 depend from claim 1 and are therefore also in suitable condition for allowance. Reconsideration and withdrawal of the Examiner's rejection is requested.

Claims 1-6, 8-10, 12, 14 and 16 stand rejected under 35 U.S.C. §102(e) as being anticipated by Stam, et al., U.S. Patent No. 5,923,027. This rejection has been maintained from the previous Office Action dated July 19, 2002, with respect to claims 1-6, 8-10 and 12, and has now been applied to the claims 14 and 16. In response to the previous Office Action, the Applicant asserted that claims patentably defined over Stam, et al., because Stam, et al., does not teach or suggest a control unit that manages the radiation source and analyzes the rays received by the photodetector. Figure 6 of Stam, et al., shows timing and control circuitry 37 for the image array sensor 32 in communication with a microcontroller 38. The timing and control circuitry 37 is not shown in communication with the LED 66.

In response to the Applicant's assertion, the Examiner states that Stam, et al., teaches synchronization of an LED with an imaging process in column 10, lines 32-34 and that this implies a single control unit. The sentence cited by the Examiner states:

"The LED 66 is initially turned off and an image is taken. Immediately following, the LED is turned on a second image is taken."

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It is respectfully submitted that this statement does not necessarily mean that the imaging array is turned on and off in synchronization with the LED 66 by a single controller. The LED could be pulsed while the image array is operable to continuously receive and process images. It is submitted that the express teachings of the '027 patent are more relevant. In particular, Figure 6 of Stam, et al., shows the imaging array sensor 32 in communication with a timing control circuit 37 and a micro controller 38, but not the LED 66. The LED 66 is shown in Figures 1-3 and in none of these figures is the LED 66 shown in communication with the microcontroller 38 or the timing and control circuit 37. Figure 5 of Stam, et al., is a flow chart illustrating the process steps performed by the device of Stam, et al. The step 46 for acquiring an image of a windshield does not indicate that the LED 66 and the imaging array 32 are synchronized. It is therefore submitted that claim 1 patentably defines over Stam, et al. and is in suitable condition for allowance. Claims 2-6, 8-10, 12, 14 and 16 depend from claim 1 and therefore also patentably define over the reference. Reconsideration and withdrawal of the Examiner's rejection is requested.

Claims 7 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Stam, et al. This rejection has been maintained from the previous Office Action dated July 19, 2002. Claim 7 depends from claim 1 and therefore patentably defines over Stam, et al. for the reasons provided immediately above. Claim 11 recites the device is an integral part of an interior light module of a vehicle. In response to the previous Office Action, the Applicant traversed the Examiner's rejection since the Examiner had not identified a reference teaching a device for detecting particles on a windshield integral with an interior light module of a vehicle. Applicant requested that if the Examiner was relying on common knowledge, that the Examiner cite a reference in support of his position pursuant to M.P.E.P. § 2144.03.

In response to Applicant's traversal, the Examiner has cited Breed, et al., U.S. Patent No. 5,845,000. The Examiner has quoted from column 13, lines 10-13, that "one such sensor [may be] placed by the dome light or any other central position in the vehicle roof such as 113'." The statement quoted by the Examiner states that a sensor can be placed by a dome light but does not teach or suggest a device integral with a interior light module. It is respectfully submitted that the terms

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"by" and "integral with" are not interchangeable. It is further submitted that claim 11 patentably defines over the references and is in suitable condition for allowance, in addition to being allowable by dependency from claim 1. Reconsideration and withdrawal of the Examiner's rejection is requested.

Claim 13 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Stam, et al., in view of Hegyi, U.S. Patent No. 5,703,568. This rejection has been maintained from the previous Office Action dated July 19, 2002. In response to the previous Office Action, the Applicant asserted that Stam, et al., did not teach or suggest a control unit that manages the radiation source and analyzes the rays received by the photo detector and that Hegyi did not overcome this deficiency. Specifically, in Figure 2 of Hegyi, the LED array 32 is shown coupled to an LED driver 31. The photodiode 12 is shown to be isolated from the LED driver 31. The Examiner has not specifically responded to the Applicant's arguments, but has relied on the arguments he asserted against claim 1 in view of Stam, et al. For the reasons set forth above, it is submitted that claim 1 patentably defines over Stam, et al. as well as Hegyi. Reconsideration and withdrawal of the Examiner's rejection is requested.

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Stam, et al., in view of an article entitled Image Capture Circuits in CMOS by Eric R. Fossum. Claim 15 depends from claim 1 and, for the reasons set forth more fully above, is in suitable condition for allowance. In particular, Stam, et al. does not teach or suggest a device having a single control unit and Fossum does not overcome this deficiency. Reconsideration and withdrawal of the Examiner's rejection is requested.

Claim 17 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Stam, et al., in view of Vachss, U.S. Patent No. 5,313,072. Claim 17 depends from claim 2 and recites the light emitting diode is operable to emit optical rays having different intensities. The Examiner cites column 3, lines 53-57 of the '072 patent as disclosing a light emitting diode operable to emit optical rays having different intensities. However, that portion of the '072 patent states "to further improve determination of light from source 11, source 11 and optical imager 16 may be designed to emit and detect a specific, narrow wave length of radiation,

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which may also be pulsed at a known rate and separately identified from other sources." Claim 17 does not recite that the light emitting diode pulses optical rays, but recites that the light emitting diode is operable to emit optical rays having different intensities. The portion of the '072 patent cited by the Examiner specifically teaches the opposite: an imager 16 designed to emit a specific wave length of radiation. Vachss does not teach or suggest that the pulses of radiation emitted by the imager 16 can be emitted at different intensities. It is therefore submitted that claim 17 patentably defines over the references and is in suitable condition for allowance. Reconsideration and withdrawal of the Examiner's rejection is requested.

Claim 18 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Stam, et al., in view of Breed, et al. Claim 18 is dependent on claim 1 and is therefore, is allowable by dependency. In particular, neither Stam, et al., nor Breed, et al., teach or suggest a single control unit. Reconsideration and withdrawal of the Examiner's rejection is requested.

It is respectfully submitted that this Amendment traverses and overcomes all of the Examiner's objections and rejections to the application as originally filed. It is further submitted that this Amendment has antecedent basis in the application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the application.

This amendment should be entered because it does not add new matter to the application. This amendment does not raise new issues requiring further search or consideration by the Examiner. Specifically, the Examiner has previously considered the single control unit recited in claim 1, the Applicants raised the issue with the Examiner in response to the previous Office Action. The amendment should be entered because it does not add new claims without cancelling a corresponding number of claims. Alternatively, this amendment should be entered because it simplifies the issues on appeal. Specifically, the objection to claim 18 has been eliminated.

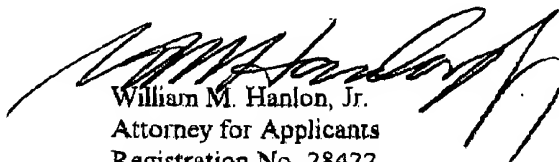
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If the Examiner feels that prosecution of the present application can be expedited by way of an Examiner's amendment, the Examiner is invited to contact the Applicant's attorney at the telephone number listed below.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Twice Amended) A device for detecting particles on a windshield a motor vehicle with a radiation source which emits optical rays onto the windshield with a photodetector which receives a portion of the rays emitted onto the windshield, and with a single control unit, which manages the radiation source and analyzes the rays received by the photodetector characterized in that the radiation source is positioned outside the field of vision of a driver of the vehicle and is aligned in such a way that the light rays from the radiation source strike the windshield in the area of the field of vision, and that the photodetector is pointed at the area of the windshield which the optical rays from the radiation source strike.

18. (Amended) The device of claim [11] 2 wherein the light emitting diode is positioned such that the optical rays strike the windshield at a similar angle with respect to a driver's line of sight.